DRAFT FACTUAL REPORT

Sinking of the U.S. Small Passenger Vessel *Panther*
Near Everglades City, Florida
December 30, 2002

National Transportation Safety Board
490 L'Enfant Plaza, S.W.
Washington, D.C. 20594

Contents

Abbreviations and Acronyms

1	**CFR**	*Code of Federal Regulations*
2	**COI**	certificate of inspection
3	**D7CC**	District 7 command center (Coast Guard)
4	**EMS**	emergency medical services
5	**ICAO**	International Civil Aviation Organization

Factual Information

Synopsis

Shortly after 1430[1] on December 30, 2002, the U.S. small passenger vessel *Panther*, a 31-foot open, wood-and-fiberglass boat operated by Everglades National Park Boat tours (see **figure 1**), sank in Indian Key Pass, about 3 1/2 miles from Everglades City, a town in Collier County, Florida (see **figure 2**). The *Panther* was midway through a tour of the Ten Thousand Islands area of Everglades National Park, with 33 passengers on board plus a master. Three nearby vessels responded to the accident and rescued the master and the passengers from the water. Because of conflicting information about the number of passengers on board, an extensive search-and-rescue operation was launched that involved five U.S. Coast Guard stations in south Florida; however, responders did not find any passengers in the water. No fatalities resulted from the accident, but one passenger suffered a serious injury.

Figure 1. *Panther* on tour in Everglades National Park.

Figure 2. Accident site and other locations referenced in this report.

[1] All times are eastern standard time, based on a 24-hour clock. Information on the sequence of events came from oral interviews as well as written Coast Guard situation reports. When the times stated by interviewees disagreed, or when no time was reported in either the interviews or the situation reports, the Safety Board used its best judgment to estimate when a particular event took place.

Preaccident Events

Coast Guard Inspections

The *Panther* was inspected and certificated by the U.S. Coast Guard as a small passenger vessel under the regulations of Title 46 *Code of Federal Regulations* (CFR) parts 175-185. The boat had last been drydocked for a Coast Guard examination on December 31, 2000. According to the Coast Guard's inspection record, the outside hull was found to be satisfactory. On May 3, 2001, the Coast Guard inspected "all voids, compartments, bulkheads, [and] stiffeners" on the *Panther* and issued a new certificate of inspection (COI).[2] The boat underwent its last Coast Guard reinspection on May 21, 2002. Nine checklist items were listed as "inspected satisfactory" (among them construction/loadline, electrical, lifesaving, and stability), and three nonstructural deficiencies were listed as "found and corrected." Further information is found later in the report (see "Other Information" section). The *Panther* was scheduled for another drydock inspection on December 31, 2002—the day after the accident.

Previous Grounding

In early December 2002, the *Panther* grounded in Indian Key Pass while on a regular nature tour through the Ten Thousand Islands area of Everglades National Park. The tours began and ended at the National Park Service visitor center near Everglades City (see **figure 2**). Two passengers and a master[3] were on board; it was the master's

[2] Small passenger vessels carrying more than six passengers for hire may not operate without a valid Coast Guard COI, which is issued by the Coast Guard Officer in Charge, Marine Inspection, for the zone in which the boat operates. The COI, among other conditions, stipulates minimum firefighting, lifesaving, and staffing requirements. When determining the number and competencies of the crewmembers, the Officer in Charge, Marine Inspection, considers many factors, including the size of the vessel, its route, the type and horsepower of the vessel's propulsion machinery, the number of passengers, the type and location of lifesaving equipment, and the hazards peculiar to the route and service.

[3] The Safety Board interviewed three company masters who had been on board the *Panther* on problematic trips during December 2002. Altogether, Everglades National Park Boat Tours had engaged five licensed masters for the 2002-2003 season. It was common practice for the masters to rotate among the various boats.

third season with the tour boat company. The tour boat company did not report the grounding to the Coast Guard and kept no maintenance records, so the Safety Board could not precisely date the incident. However, the master recalled that it had happened during the first week in December.

The master told Safety Board investigators that on his way back to the visitor center, he went outside the channel, going about half-throttle (7 knots), to show his passengers a particular bird as part of the nature tour when the *Panther* grounded on mud and shells. He said he felt the boat "raise a little bit and then go down." As he backed the boat out of the shallows, he said he heard the propeller strike a layer of seashells that covered the bottom of the bay in the area. He noticed that once under way, the *Panther* handled differently, exhibiting a vibration consistent with a propeller that was "nicked up," and that the engine started to overheat. To prevent further damage, the master stopped the engine, anchored the boat, and called for assistance.

One of Everglades National Park Boat Tours's maintenance men and one of the owner's two sons, both of whom worked for the company, went to the anchored vessel, cleaned sand and shells out of the *Panther*'s engine cooling water intake ("sea strainer"), and fixed a hole in the radiator. The maintenance man said he found "no indication of water in the bilge." The master transferred his two passengers to another tour boat, and the *Panther* returned to the marina under its own power. The maintenance men replaced the engine's water pump's impeller, and the boat returned to service the day after the grounding.

The vessel was not pulled out of the water to be inspected for bottom damage, and no repairs were made to the hull. The master said he did not think he had damaged the bottom of the *Panther* when he grounded it, and one of the owner's sons said the hull and

bilge pumps were "fine" after the grounding. However, the master also said that the maintenance men "always" seemed to be working on the *Panther* after the grounding. The owner, the sons, and the maintenance men all indicated when interviewed by Coast Guard and Safety Board investigators that they did not know that groundings were a casualty that had to be reported to the Coast Guard.[4]

Postgrounding Problems

Low Freeboard. The master on the day of the grounding told Safety Board investigators that he had experienced a problem with the *Panther* riding low in the water about 2 weeks afterward. Again, the Safety Board could not pinpoint the date of the incident because the tour boat company did not keep maintenance records.

The master said he was returning to the marina with a full load of passengers, saw that he had a low freeboard, thought the vessel was taking on more water than normal, and "figured the bilge pumps were to blame." He radioed the problem to the company's maintenance men and after discharging his passengers, took the boat to the fuel dock. The maintenance men told the master that the bilge pumps had been checked and "all the switches were working." The master said he assumed that "maybe there was a float switch that was stuck or something."[5]

The maintenance men did not inform the master of the cause of the reduced freeboard. The master told investigators that when he wanted to pump the bilges

[4] An "unintended grounding" is the first item listed at 46 CFR 4.05-1 as requiring a notice of marine casualty: "(a) Immediately after the addressing of resultant safety concerns, the owner, agent, master, operator, or person in charge, shall notify the nearest Marine Safety Office, Marine Inspection Office or Coast Guard Group Office whenever a vessel is involved in a marine casualty consisting in (1) An unintended grounding . . . ."

[5] The bilge pumps operated by built-in sensors, not float switches. See "Vessel Information" section.

continuously, he had to hold the switch on the manual setting with a rubber band because the automatic setting did not work.

Starboard List. On December 29, the day before the accident, the *Panther* returned to the visitor center marina (under a different master) listing significantly to starboard. About 29 passengers were on board. One of the owner's sons observed the list and said he saw water coming through the "scupper hole."[6] He told the Coast Guard that he advised the captain to discharge the passengers as soon as possible because he believed their weight in the stern was causing the problem. Even after the full load of passengers disembarked, however, the list remained.

According to the owner's son, the master had inadvertently shut off the starboard bilge pump switch. The master, however, said that the bilge pump did not work in either automatic or manual mode. The owner's son said he had checked the bilge pumps and that the switches worked: "I pay attention to the bilge pump." The master told Safety Board investigators that he was not informed of what had caused the list.

Accident Narrative

Preaccident Events

Shortly before 0900 on December 30, 2002, the master who was scheduled to operate the *Panther* that day (not the same master as on the trips described above) arrived at the visitor center for the first tour. The *Panther* was scheduled for a tour every 2 hours, beginning at 0900 and ending at 1500. The master said that he saw one of the company's

[6] By "scupper hole," the owner's son was referring to one of the *Panther*'s freeing ports, bulwark openings close to the deck that are designed to allow water to drain overboard. See "Vessel Information" section for details of the *Panther*'s construction.

maintenance men working on the *Panther*, doing what looked to him like electrical work. The master said the maintenance man told him, "I've got a bilge pump to look at." Because of the repair work in progress, another of the company's tour boats, the *Manatee*, took the 0900 run. The maintenance man said that he replaced the *Panther*'s engine starter switch because the master had told him earlier that the engine was slow to shut off, and that he also replaced the wiring to the starboard bilge pump. The maintenance man said that before the *Panther* returned to service, he tested the bilge pumps and the starter switch and that they were working properly.

The *Panther* left on its first trip of the day at 1000, following its usual route through a marked channel into Chokoloskee Bay and then into Indian Key Pass (see **figure 2**). The trip typically took about 1 1/2 hours, with its turnaround point 3 1/2 miles to 5 miles from the visitor center. (The distance of a trip depended on the natural sights, the weather, and other factors, at the master's discretion). The master said that the boat handled well and showed no indications of problems on the trip. The *Panther* left on its second trip of the day at 1200, the same master on board. He reported that the second trip was uneventful. After the passengers disembarked, he prepared for his third trip at 1400.

Passengers for the 1400 trip waited at the dock for the master, who was taking a short break and had asked no one to board until he returned. One of the passengers, a mechanical engineer, told Safety Board investigators that while he was waiting for the master to return, he saw the *Panther*'s bilge pumps cycling on and off every 30 seconds and observed a steady stream of water discharging from the vessel. The passenger estimated each discharge at 3 to 4 gallons. He also said that the *Panther* looked to be riding low in the water: ". . . like if you leaned over from the seats in the stern, you could touch the water with your elbow."

At 1340, the master returned to the boat and started boarding the passengers. He said the passengers chose their own seats, although he advised them to sit aft if they wanted to avoid the sea spray. After the passengers were seated, the master said he determined by counting the empty seats that he had 34 on board.[7] He did not count the number of passengers or the number of tickets or inform personnel at the company office of the number of passengers on board. When the office personnel waved for the master to leave, he hooked a chain across the boarding area, started the engine, released the mooring lines, and moved the boat away from the dock (see **figure 3**).

Figure 3. *Panther* leaving boarding area at Everglades National Park visitor center.

The master said he exited the boat basin (dock) at 1355. As the *Panther* moved away from the dock, the master, who was the only crew member, introduced himself to the passengers and, using the boat's public address system, gave them his standard safety briefing, which he had developed himself, rather than receiving it from the company. He told the passengers that lifejackets were located under the seats in front of them; he did not take any of the lifejackets out of the storage lockers or demonstrate how to put one on. He also told them that the boat had a fire-extinguishing system and a VHF radio, and that he held "a master mariner's license administered by the Coast Guard." He predicted "a very safe and stable ride."

After departing from the marina at the Everglades National Park visitor center, the master steered the *Panther* down a marked channel into Chokoloskee Bay and then entered Indian Key Pass (see "Waterway Information," below, for details of the area). The master told investigators that he noticed no problems with the boat, that the engine

[7] Safety Board investigators later determined that, although the master repeatedly stated that he had 34 people on board the *Panther*, he actually had only 33 (see end of this section). Conflicting information about the number of passengers led to an extensive search-and-rescue effort, as described in the "Survival Aspects" section.

was working properly, and that no bilge pump indicator lights were on. He said he was making 3 1/2 or 4 knots during this part of the trip.

At 1400, according to the master, he began a nature narration while moving slowly through Indian Key Pass, pointing out birds to the passengers and asking them to look for dolphins. He told investigators "the vessel maneuvered properly," with no indication of problems. When the master saw a pod of about three Atlantic bottlenose dolphins, he increased the *Panther*'s speed to 8 or 10 knots and tried to pull alongside the animals to give the passengers a good view of them. He said some of the passengers stood up and moved to the railing, and that the boat "heeled just slightly to port, but nothing in any way strange." After the dolphins submerged, he turned slowly to starboard to see if the animals would surface nearby. He told investigators that he was going at half speed and that the passengers were standing. He said he still had no indication of problems with the *Panther*, but that when he "brought the throttle back" (decreased speed), he felt the "stern set a little bit more than usual," which he attributed at the time to "heavy-set" passengers seated in the stern.

The passengers told investigators that when the master entered Indian Key Pass, he sped up until a large wake formed behind the vessel. The master told them he was trying to attract dolphins into jumping over the wake. The jumping dolphins created an opportunity for passengers to take photographs (see **figure 4**). According to the passengers, the master made two or three sharp 180-degree turns into the vessel's wake and was "revving" his engine. They said that between turns, the master moved passengers to the aft seats so their extra weight would push the stern lower into the water and increase the wake.

Figure 4. Dolphin leaping in *Panther*'s wake (photograph taken about a year before accident trip).

Passengers who sat near the stern said that while the master was taking the *Panther* through these maneuvers, water began to accumulate in the stern of the boat, and that by the last turn, the water was ankle deep. One person said, "With each turn, more water would come in, first through the bottom, then over the top." Another passenger stated, "Water was constantly coming over the wall of the boat and into the passenger compartment. Five or six times during the trip water was ankle- to knee-deep where I was sitting" (at the stern).

About a half-hour into the trip, the *Panther* turned around near marker 7 in Indian Key Pass (see **figure 5**) to return to the visitor center (marker 7 is about 3 1/2 miles from the center). So much water began spilling over the sides of the boat at this point that the master stopped the boat. Passengers said that the master did not seem to realize the *Panther* was flooding "until it was too late" and that by the time the boat stopped, people in the stern had water up to their knees, and smoke was coming out the back of the boat.

Figure 5: *Panther*'s route from National Park Service visitor center to site of sinking.

About the time the *Panther* stopped, a commercial crab boat, the *Red Rock,* came into Indian Key Pass on its return to Everglades City, moving at less than 5 knots because it had broken a propeller strut earlier in the day. The three occupants of the *Red Rock*—the captain, his son, and his son's friend—saw the *Panther* ahead of them, noticed that it was low in the water, and changed course to have a closer look. Their position at the entrance to Indian Key Pass was about a mile from the *Panther*'s location.

Passengers reported that the *Panther* remained stopped for between 5 and 10 minutes. The master told investigators that he noticed water on the deck and switched the bilge pumps on manually. He said that all the bilge pump lights were on (an indication that the pumps were operating), but that he "questioned whether they were pumping." He

said that the bilges often held water and "sloshed," especially when moving through other boats' wakes and with water leaking through the *Panther*'s shaft packing gland. Because he could not see the bilge discharge from the helm, he asked a passenger to look at the overboard discharge to check whether the bilge pumps were working. The passenger looked over the starboard side and told the master that "the water was almost even with the top of the boat so he could not tell" whether water was discharging through the bilge overboard discharge line.

The Sinking

Master's Account. According to the master, when the passenger looked over the side to check the bilge discharge, the *Panther* was hit by the wake from a passing crab boat and immediately sank stern first. The master said that he told the forward passengers to "grab a life preserver" because the water in the boat was already too deep for the passengers in the back to reach their lifejackets. He told investigators that "there was a lot of panic" and that he tried to calm the passengers. He said the engine cover (measuring about 6 feet by 4 feet) floated off and some of the passengers hung onto it. About 6 to 8 feet of the bow rail on the port side remained above water, he said, "so we all started grabbing the forward rails, and everyone was holding on to one another."

At this point, the master said that he waved "frantically" to the *Red Rock*, which he said "circled the boat and approached us stern first." The master said he told the passengers to stay on the boat and that he yelled to the crab boat to "notify the Coast Guard." He said that "when the crab boat got within about 20 to 25 foot [sic] of our vessel, everyone in distress started swimming towards the crab boat," and he realized he had lost control of the group. He then yelled to the crab boat captain to put the crab boat in neutral to protect the swimming passengers from the propeller.

The master said he hung on to the *Panther*'s exposed bow rail with an elderly couple who were poor swimmers. The master swam away from the *Panther* to look for one of the child passengers, but the child turned out to already be on the crab boat. A recreational boat (a 30-foot "Royal" cabin cruiser, the *Hoosier Daddy*) that happened to be in the area threw the master a lifejacket. The master said that he returned to the *Panther*, and that the *Hoosier Daddy* rescued him and two passengers from the railing.

Account of First Responders and Passengers. The *Red Rock*'s captain told Safety Board investigators that after being hailed by the master of the *Panther*, he turned to starboard and motored forward of the *Panther*'s bow, intending to bring his boat along the other's port side. When the *Red Rock* was within 2 feet of the tour boat, the *Panther*'s master told him that his boat was sinking and that the *Red Rock* would have to take his passengers. Within a few seconds of the *Red Rock*'s arrival, the *Panther* sank.

One of the passengers told investigators that as the *Red Rock* approached the *Panther*, the master "yelled to the passengers that the vessel was sinking." He said the passengers "lunged to the port side," toward the *Red Rock*, which caused the boat to heel to port, which then caused the deck to go underwater and the vessel to quickly sink The other passengers described the *Panther* as sinking in seconds after the *Red Rock* came alongside. One passenger said, "The boat just disappeared from underneath us." One passenger told investigators that a wave from the *Red Rock* swamped the *Panther*.

The captain of the *Red Rock* confirmed that the passengers rushed to the *Panther*'s port side when he pulled alongside. Some passengers said they jumped (or passed their children) directly onto the *Red Rock*, while others swam to it. According to the captain of the *Red Rock*, "Passengers were clawing at one another, climbing on top of one another. It was disgusting."

About 1440, the captain of the *Red Rock* radioed the news of the *Panther*'s sinking to the radio operator at Everglades City Seafood (the commercial crab boats did business with that company and kept in contact with the operator). From 5 to 8 passengers remained in the water. Some reportedly hung onto the floating engine cover or a ring buoy. One passenger said that as she drifted away from the *Panther,* an elderly woman floated past, commenting, "This is a bit much for an 85-year-old woman, don't you think?" The *Red Rock* captain said he drifted until all the swimmers were on board, then motored to pick up three passengers clinging to a life buoy. About the same time, a National Park Service ranger boat that was patrolling in Indian Key Pass radioed the Park Service visitor center that the *Panther* had sunk and that passengers were in the water. The ranger then rescued two passengers who were clinging to the *Panther*'s railing.

About 3 feet of bow rail remained above the water when the *Panther* sank (see **figure 6**). According to measurements made by Safety Board investigators, the water at the accident site was 10 to 12 feet deep.

Figure 6. *Panther* submerged in Indian Key Pass.

Search and Rescue

Once on board the *Hoosier Daddy,* the master of the *Panther* sent out a distress call over VHF-FM channel 16 that, according to the Coast Guard situation report, was picked up at 1450 by the Group station in St. Petersburg, a little over 150 air miles north of the accident site (see **figure 2**). The Coast Guard described the transmission as "weak and broken" and lost communication shortly after receiving the call. Within minutes, the Coast Guard launched a search-and-rescue mission that would eventually involve District 7 headquarters in Miami, Group St. Petersburg (which took the lead role), and three other

Coast Guard stations: Air Station Clearwater (170 air miles north of the accident site), Station Ft. Myers Beach (61 air miles north), and Air Station Miami (75 air miles east).

Two boats sent by the tour boat company helped return the rescued passengers to shore. Collier County emergency medical services (EMS) in Everglades City sent emergency vehicles and personnel to the National Park Service visitor center, and Park Service employees helped those rescued once they returned to the visitor center. The sequence of events during the search and rescue is described later in the report (see "Survival Aspects" section).

Altogether, the Coast Guard conducted five searches of the accident area. No passengers were found in the water, and none of those rescued was taken to the hospital (see "Injuries," below). However, responders could not ascertain the number of passengers on board the *Panther* because neither the tour boat company nor the Park Service had a passenger manifest, and no head count was ever taken of those rescued. Safety Board investigators ultimately determined that the *Panther* had carried 33 passengers on the accident trip.[8]

Injuries

Four of the passengers reported minor injuries (cuts, sprains) but did not seek medical attention. One passenger suffered a broken rib, revealed by X-rays taken the day after the accident. She believed the injury occurred when she hit the side of the crab boat

[8] The Safety Board interviewed at least one member of all parties who had been on the accident trip (everyone on the tour was part of a family or a couple). All those interviewed reported that everyone in their party was accounted for, and the total number of persons in all parties was 33.

after jumping from the sinking *Panther*. The injuries sustained in the accident are listed in table 2.[9]

Table 1. Injuries sustained

Injuries	Crew	Passengers	Total
Fatal	0	0	0
Serious	0	1	1
Minor	0	4	4
None	1	28	29
Total	1	33	34

Title 49 CFR section 830.2 defines a fatal injury as any injury that results in death within 30 days of an accident. It defines serious injury as that which requires hospitalization for more than 48 hours, commencing within 7 days from the date the injury was received; results in a fracture of any bone (except simple fractures of fingers, toes, or nose); causes severe hemorrhages, nerve, muscle, or tendon damage; involves any internal organ; or involves second- or third-degree burns, or any burn affecting more than 5 percent of the body surface.

Damage

The *Panther*'s owner did not commission a damage survey of the vessel. The Safety Board estimated the vessel damage at $60,000. The owner salvaged the vessel and removed it from the water. As of the date of this report, the owner had removed the engine from the *Panther* but had not yet undertaken repairs (see "Wreckage" section for more information).

Personnel Information

The 46-year-old master was hired by Everglades National Park Boat Tours in January 2002 for a seasonal position (usually, December to May). He worked until July,

[9] Injuries are categorized according to the injury criteria of the International Civil Aviation Organization (ICAO). The Safety Board uses the ICAO injury criteria in all its accident reports, regardless of transportation mode.

left for a vacation, then returned to Everglades National Boat Tours on December 1 for the new season. He told Safety Board investigators that he normally made four trips a day during the season, sometimes five a day during high-volume periods such as Easter week. Each tour lasted about 1 1/2 hours, with a 30-minute break between.

The master had previously been employed as an operator of small tourist boats at a resort on Marco Island, Florida, 15 miles north of Everglades City (see **figure 2**). The master was laid off when tourism declined after the September 11, 2001, terrorist attacks. According to his résumé, the master also had recreational boating experience in the Gulf of Mexico, the eastern and western Caribbean, and the eastern Pacific. He had been a private boat owner since 1985, and had delivered yachts and operated private sailboats.

On May 15, 2000, the master received a Coast Guard license as "master of steam, motor or auxiliary sail vessels of not more than 25 gross registered tons (domestic tonnage) upon near coastal waters." The license, due to expire on May 15, 2005, also authorized the master to engage in commercial assistance towing. The master's license permitted him to operate all but the largest tour boat (the 55-foot *Manatee II*) owned by Everglades National Park Boat Tours. Coast Guard regulations did not require the master to receive any formal training in emergency response or crowd control, nor did he receive any.

The master reported that he had slept at least 8 hours a night during the 72 hours before the accident. He said that his overall medical condition was good and that he was not taking any prescription or over-the-counter medications.

The Coast Guard told Safety Board investigators that it had found no information to indicate that the master had ever before been involved in a marine accident. As a result of the *Panther* accident, however, in May 2003 the Coast Guard charged the master with

failure to have the required number of crewmembers, failure to have a written account of all passengers and to report that count, and failure to require the passengers to put on lifejackets after the boat began to sink.[10] In a consent agreement, the Coast Guard suspended the master's license for 3 months beginning June 1, 2003, and placed him on probation until September 1, 2004.[11]

Vessel Information

The *Panther* was an open-deck, flat-bottomed wood-and-fiberglass boat built in 1968[12] in Chokoloskee, Florida (see **figure 2**). The owner of Everglades National Park Boat Tours had used the *Panther* since it was built to carry passengers on tours of the Everglades. The characteristics of the *Panther* are summarized below:

Length:	31 feet
Beam:	10 1/2 feet
Depth:	2 1/2 feet
Gross tonnage:	4
Crew:	1 (master, plus 1 deckhand if 30 or more passengers on board)
Passenger capacity:	37
Propulsion:	225-horsepower Perkins-Sable diesel engine

Construction and Equipment

The hull of the *Panther* consisted of fir frames planked with sheets of fiberglass-covered, 1/2-inch-thick marine plywood. The deck beams were made of cypress. A

[10] Judith Lester, "Captain Loses License," *Everglades Echo Online*, June 30, 2003 <www.evergladesecho.com/articles/2003/06/27/fton/top_stories/news02.txt>.

[11] Mireidy Fernandez, "Coast Guard Suspends License of Captain of Sunken Tour Boat," *Naples (Florida) Daily News*, June 14, 2003 <http://cfapps.naplesnews.com>.

[12] The Coast Guard provided the Safety Board with hand-drawn plans for the boat's construction, dated March 1964 and stamped as approved in July 1968 by the Officer in Charge, Marine Inspection, Miami.

continuous bulwark enclosed the boat's flat deck and extended 13 inches above it, with deck rails mounted on top of the bulwarks (see **figure 7**). At the stern, two 3-inch-diameter freeing ports, designed to allow water to run off the deck, cut through the bulwark about 6 inches above the light-load waterline (see **figure 8**). The freeing ports were about level with the deck. The *Panther*'s freeboard was thus approximately 6 inches.

Figure 7. Arrangement of *Panther*'s deck rails and bulwarks, as boat rested on marine railing after accident.

Figure 8. Diagram of *Panther*'s stern showing freeing ports and other features.

The engine was located in the center of the boat, with the steering console immediately behind it (see **figure 9**). A shaft tunnel 7 1/2 feet long ran aft along the centerline beneath the deck, reinforced by fore-and-aft timbers (stringers) along the outside. The bilges (each measuring 7 1/2 feet long, 3 feet wide, and 1 1/2 feet high, or about 34 cubic feet in volume) were on either side of the tunnel, under the main deck, and did not connect with the tunnel. The fuel line, engine exhaust hose, and bilge pump discharge lines ran through the tunnel.

Figure 9. Layout diagram of *Panther* showing tunnel, engine, console, passenger seats, and bilge pump locations.

The *Panther*'s COI listed the original engine, rated at 160 horsepower. The tour boat owner had no records indicating when the new 225-horsepower engine had been installed, but he estimated that it had been done about 2 years before the accident. According to the master, the vessel's normal operating speed was 5 to 6 knots, with a maximum light-load speed of 12 to 14 knots and a half-throttle speed of about 7 knots.

The boat had three bilge pumps manufactured by Rule Industries (now part of ITT Industries),[13] each with a rated pumping capacity of 1,500 gallons per hour. One bilge pump was located in the port quarter, one in the starboard quarter, and one in the engine compartment. The housings of the bilge pumps contained printed circuit boards. A timer built into the circuit boards cycled the pumps on every 2 1/2 minutes. Unless the pumps sensed resistance to their impellers (from either fluids or solids such as dirt), they would go off after operating for 1 second. If the pumps sensed resistance, they would continue to operate until the impellers moved freely again.

The printed circuit boards had three leads, two going to the pump motor and one going to an indicator light. Each time a pump cycled on, the indicator light would illuminate. Thus, if the impeller encountered no resistance, the bilge pump indicator light would go off for 2 1/2 minutes, on for 1 second, then back off.

The bilge pumps were controlled by three separate switches mounted on the steering console, each having a neutral, automatic, and manual position (see **figure 10**). In neutral position, the pumps were off. In automatic position, the pump cycled on and off as described above. In manual position, the pump was on continuously (as was the indicator light). Discharge from all three bilge pumps was directed through a single manifold to a through-hull fitting on the starboard side of the vessel, a few inches above the deckline and slightly forward of the steering console.

Figure 10. View of console showing bilge pump switches to right of wheel.

The mounting plate for the steering assembly was in the tunnel near the stern. The plate was bolted through three wooden support blocks, through the hull planking, and to

[13] Rule's U.S. offices are in Gloucester, Massachusetts.

the strut (see **figure 11**). The upper block was made of southern yellow pine, the center block of plywood, and the lower block of bald cypress. The tunnel was covered with removable deck boards that were flush with the main deck. The boards had to be removed to inspect the tunnel.

Figure 11. Support structure (cutaway view at stern).

The engine compartment was fitted with a 12-volt D.C. high-level, float-switch-type bilge alarm.[14] The device was designed so that when water entered the engine compartment, the float would rise and at a predetermined height, activate a switch that would energize an audible alarm and illuminate a red light on the vessel's console. Two of the masters interviewed during the investigation, including the *Panther*'s master on the day of the sinking, had no knowledge of the alarm and had never heard it sound. The alarm was submerged when the *Panther* sank. Safety Board and Coast Guard investigators examined the switch after the accident and found a disconnected wire. The alarm was sent for testing to the Safety Board's Materials Laboratory. With the wire connected, the alarm was found to be operational.

Certification

The Coast Guard COI issued on May 3, 2001, permitted the *Panther* to operate not more than 1,000 feet from shore in the waters between Everglades City and Chokoloskee (see **figure 2**). According to the COI, the total number of persons allowed on the *Panther* was 39, including 37 passengers and 2 crewmembers. The boat was required to have a licensed master, with the additional requirement to carry a deckhand if

[14] Vessels 26 feet or longer are required by 46 CFR 182.530 to be provided with alarms that emit visible and audible signals indicating high water levels in bilges and other unmanned spaces.

the boat carried 30 or more passengers. If fewer than 30 passengers were on board, the COI required no deckhand.

The master told Safety Board investigators that he had never seen the COI for the *Panther* and that during his orientation as a new employee of Everglades National Park Boat Tours, other company masters had told him that the vessel had been "grandfathered" to previous regulations and that a deckhand was not required. The owner told investigators that it was the master's responsibility to ensure that a deckhand was on board when the vessel carried 30 or more passengers. The owner also said that someone was always standing by to serve as a deckhand if necessary. One of the owner's sons, however, told Coast Guard investigators that he was not aware that the *Panther* vessels had ever carried a deckhand.

The master who had operated the *Panther* the day it grounded in early December 2002 stated that in his three seasons of working for the tour boat company, the owner had never told him that the vessel was supposed to carry a deckhand when it had 30 or more passengers on board. He said he had seen the *Panther*'s COI stowed in a lifejacket compartment.[15]

Wreckage

Salvage Operations

The *Panther*'s owner and his sons began salvage operations immediately after the accident. Just after the *Panther* sank, one of the sons left for the accident scene in one of

[15] Title 46 CFR 176.302 requires the COI to be kept on board a vessel, either displayed where it can be seen by passengers, or in the case of an open boat, "in a watertight container readily available for use by the crew and display to passengers and others on request."

the company's six-passenger boats. As he neared the scene, the son met the rescue vessels returning with the passengers. After determining that no one had reported an injury and hearing that all passengers were accounted for, he asked a maintenance man on one of the returning vessels to board his boat, and both men continued toward the accident scene.

By the time they reached the site of the sinking, about 1515, a passing crab boat had towed the *Panther* to a sandbar about 300 yards away. According to the owner's son, the crab boat operator was concerned that other vessels returning to Everglades City might collide with the partially submerged *Panther*. The crab boat operator had run a mooring line from the bow of the *Panther* and tied it to nearby mangroves. The son told Safety Board investigators that he and the maintenance man retrieved the engine cover (which had floated free during the sinking) and one of the hatches from the *Panther* and returned to the visitor center.

The owner's other son was out of the area on business but returned to the visitor center just as the passengers were arriving on the rescue vessels. After learning details of the accident from the owner, the two sons arranged to use a crab boat with a hoist and returned to the accident site, intending to tow the *Panther* back to the visitor center marina. The company's maintenance men accompanied them in one of the other tour boats, the 31-foot *Skimmer*. Two Park Service employees (a ranger and a maintenance worker) who had arrived at the site shortly before, however, told the sons the vessel could not be moved without the Coast Guard's permission. The Park Service employees and the sons stayed in the area until two investigators from the Coast Guard Marine Safety Office in Miami arrived at the site about 2230. After taking photos, the Coast Guard investigators gave the sons permission to move the *Panther* farther onto the sandbar, so it would be above water at low tide the next morning (the vessel was submerged above the

bulwarks). The *Skimmer* pulled the *Panther* about 30 feet farther onto the sandbar, and the sons and maintenance men returned to shore.

The Coast Guard investigators informed the owner and his sons that a salvage plan had to be prepared and approved by the Coast Guard before the *Panther* could be towed back to the visitor center marina. At low tide, or about 0900 the next morning, the owner's sons, the maintenance men, and one of the Coast Guard investigators returned to the vessel to survey the damage. The vessel was resting on the sandbar (see **figure 12**). The sons and the maintenance men boarded the vessel and, according to their statements, found a damaged area near the strut block in the tunnel.

Figure 12. *Panther* beached on sandbar near accident site.

The two sons and the maintenance men returned to the visitor center marina and drafted a salvage plan for submission to the Coast Guard. According to the first item in the plan, the owner was to "temporarily patch hole in tunnel caused by us beaching the vessel last night." (See "Postsalvage Examination," below.)

The vessel floated free on the incoming tide, and the *Skimmer* towed it to the visitor center marina. During the trip, one of the men had to maintain pressure on the damaged area to prevent water from pouring into the vessel. Water continued to enter the boat, and the men had to pump the bilges four or five times before they arrived at the marina.

Postsalvage Examination

The *Panther* was hauled out of the water and onto a marine railway owned by the tour boat company at the visitor center marina. Safety Board and Coast Guard

investigators examined the vessel and found a crack in the underside of the hull, originating at the strut plate that supported the rudder post and steering assembly (refer to **figure 11**). The crack was C-shaped, with each section of the C about 6 inches long (see **figures 13a and 13b**). The open part of the C, which surrounded the strut plate, was pushed upward, creating a hole about 2 inches long and 1 inch wide (see **figure 13b**). The investigators conducted a hose test, directing a stream of water onto the internal section of the shaft tunnel over the strut blocks. The water passed through the hull and exited at the damaged area on the underside of the hull.

Figure 13a. C-shaped crack around strut plate (hole visible on left, toward stern).

Figure 13b. Closeup of hole in crack around strut plate.

Coast Guard inspectors directed the owner to remove the engine exhaust hose that ran over the starboard stringer. Once the steering gear assembly and mounting plate were removed, the top strut support block was exposed (see **figure 14**). As the owner attempted to pry the top support block free, it splintered and had to be removed in pieces. The middle and lower support blocks between the plate and hull were removed intact. Safety Board investigators sent all three blocks to the Board's Materials Laboratory in Washington, D.C., for examination (the "Tests and Research" section describes the results).

Figure 14. Exposed top support block showing extent of rot; block splintered during removal.

When the top support block was removed, investigators observed that a rag had been used to plug a hole in the starboard stringer. The stringer was deflected upward about 1 inch from the bottom hull planking.

At the Coast Guard inspectors' request, the owner removed the seats and cut pieces out of the deck so that the bilge area and its associated internal structural supports and frames could be thoroughly examined (see **figure 15**). Investigators observed an intermittent drip of water in the starboard bilge, emanating from a deteriorated mounting screw. Although no hole was visible on the vessel's exterior, water could be seen dripping through the plywood hull and fiberglass coating.

Figure 15. View of bilge area and supports after seats and pieces of deck removed.

Waterway Information

Indian Key Pass, the site of the accident, is a dredged channel in Everglades National Park, off the southwest coast of Florida. The waterway runs from the Gulf of Mexico through the hundreds of low, uninhabited mangrove islands known as Ten Thousand Islands and into Chokoloskee Bay (see **figure 2**). The Ten Thousand Islands area covers nearly 200,000 acres along 60 miles of coastline, from Marco Island in the north to just above Cape Sable at the southwest tip of Florida. The shallow waters of the coastal estuary are brackish, a mix of freshwater flowing from the Everglades in the interior and saltwater coming from the Gulf of Mexico.[16]

The average low-water depth in Indian Key Pass ranges from 7 to 15 feet,[17] and in June 2002, the midchannel controlling (minimum) depth was 4.8 feet[18] (the site of the *Panther* sinking measured 10 to 12 feet deep). The mean tidal fluctuation at Indian Key

[16] This description of the Ten Thousand Islands area uses information from the U.S. Geological Survey <http://sofia.usgs.gov/virtual_tour/tirb/>, the *Longstreet Highroad Guide to the Florida Keys & Everglades*, by R. Ferren <http://sherpaguides.com/florida/western_everglades/ten_thousand_islands. html>, and the Everglades National Park boating page <www.everglades.national-park.com/ boat.htm>.

[17] National Oceanic and Atmospheric Administration, National Ocean Service, Coast Survey, U.S. Gulf Coast, Florida, Map 11429, *Chatham River to Clam Pass*, September 2002.

[18] National Oceanic and Atmospheric Administration, National Ocean Service, *United States Coast Pilot*, Vol. 5 (Atlantic Coast: Gulf of Mexico, Puerto Rico, and Virgin Islands), 2003, p. 213.

Pass is 3.4 feet.[19] Low tide was at 1618 the afternoon of the accident, according to National Ocean Service data. The captain of the *Red Rock* estimated that the tide was ebbing at 3 to 3 1/2 knots when he came alongside the *Panther* (the *Panther*'s master estimated the current at 2 knots). An ebbing tide flows toward the Gulf of Mexico; a rising tide flows toward the National Park Service visitor center.

Water temperatures in Indian Key Pass range from 66° F (January–February) to 87° F (July–August).[20] The average water temperature at the accident site 2 days after the sinking was 62° F, as measured by Safety Board investigators from water samples collected at depths of 6 inches to 6 feet.

Operations

Company Information

National Park Service Contract. Everglades National Park Boat Tours was a concessionaire of the National Park Service and had the sole concession for boat tours in the Ten Thousand Islands area.[21] Since about 1958, the owner had operated a tour boat company in the Gulf Coast area of the Everglades that was added to Everglades National Park in 1960. For the first few years, the National Park Service granted the company

[19] *Coast Pilot*, p. 213.

[20] National Oceanographic Data Center, Coastal Temperature Guide <www.nodc.noaa.gov/dsdt/cwtg/egof/html> (January 27, 2003).

[21] Concessionaires are private business contractors who provide various commercial services, such as food, lodging, and transportation, to visitors in the national park system. Each concessionaire signs a binding written agreement with the director of the National Park Service, which administers over 630 such contracts <www.nps.gov/legacy/business>. The park concessions are regulated under 36 CFR part 51 and the National Park Service Concessions Management Improvement Act of 1998. The National Park Hospitality Association (the concessionaire's trade group) reports that concessions operate in about one-third of the 386 areas in the national park system. In addition to national parks such as Everglades, the park system includes national monuments, national preserves, national historic sites, national seashores, national lakeshores, national recreation areas, and other types of recreational, historic, or scientific sites.

monthly or yearly permits to operate boat tours. In February 1982, the company was granted a 10-year contract with the National Park Service, which was extended annually after January 1991. The concessions management plan attached to the contract required the company's tour boats to be licensed and registered and to "be inspected by the United States Coast Guard on an annual basis." The management plan stipulates responsibilities for maintaining the building used by the tour boat company but not for maintaining the tour boats.

On January 1, 2003, the National Park Service renewed the concessionaire contract of Everglades National Park Boat Tours for 6 months, or until a new contract was awarded, to avoid interrupting visitor services in the park.[22] Under the National Parks Omnibus Management Act of 1998, the Park Service began soliciting new bids for concession contracts throughout the national park system. As of the date of this report, no company had been awarded the contract for Gulf Coast boat tours in Everglades National Park.

Day-to-Day Business. Besides the *Panther*, the owner operated four other large tour boats, all of which had current Coast Guard COIs. He also had two small excursion craft, capable of carrying six people each, which were not required to have COIs. The length, maximum number of passengers, and manning requirements of each large tour boat are as follows:

[22] *Federal Register* Vol. 68, No. 78 (April 23, 2003): 20024.

Boat	Length (feet)	Maximum Passengers	Required Crew
Panther	31	37	2*
Panther II	31	37	2*
Skimmer	31	30	2
Manatee	38.1	75	3*
Manatee II	55	104**	3

*COI allows reduced crew under certain circumstances.
**On protected route, COI allows 136 passengers.

The owner also rented canoes and kayaks and operated a small gift shop on the first floor of the Park Service ranger station. The owner, his two sons, his wife, three other women, and two maintenance men conducted the day-to-day operations of the company.

The busy season for the company was usually from December until May. Boat masters were hired seasonally and paid by the day, with no overtime or holiday pay and no vacations, according to the *Panther*'s master on the day of the accident. The company's five large boats typically made four to five tours a day, ranging from 1 1/2 to 2 1/2 hours long. The tours covered the upper reaches of the Ten Thousand Islands area of Everglades National Park. The *Manatee II* provided the additional option of a sunset cruise into the Gulf of Mexico, about 6 1/2 miles from the visitor center.

The boat masters were given the discretion to alter their voyages on the basis of local weather conditions. Neither the National Park Service nor the company required the boat masters to report deviations from their planned route or to notify anyone on shore when they reached the midpoint of a tour. The masters did not maintain radio contact

with the owner, but a VHF radio in the company office monitored channel 78, the communication channel used by all company boats.

Passenger Accountability

Passenger tickets were sold at the company-operated gift shop. Passengers could request an open-deck vessel such as the *Panther* or one of the larger vessels that had enclosed cabins. Passengers traveling as a group would be issued a single ticket noting the number in their party. If passengers requested a specific boat, its name would be handwritten on their ticket stub. The owner and some of the masters said that passengers sometimes boarded a different boat from the one named on their ticket.

Before leaving the visitor center marina, the boat master sometimes notified the gift shop by VHF channel 78 and confirmed the ticket count with the actual passenger count. Other times, the owner would give a hand signal from outside the gift shop indicating that it was permissible to depart the marina. The masters did not keep a written count of passengers. Federal regulations at 46 CFR 185.504 stipulate that

> the master of a vessel, except a vessel listed in Sec. 185.502(a) of this part, shall keep a correct, written count of all passengers that embark on and disembark from the vessel. Prior to departing on a voyage, the passenger count must be communicated verbally or in writing, and available ashore at the vessel's normal berthing location or with a representative of the owner or managing operator of the vessel. The passenger count shall be available to the Coast Guard upon request.

Masters disposed of their passenger tickets at the end of the day.

Vessel Maintenance

The owner of Everglades National Park Boat Tours told Safety Board investigators that did not maintain written maintenance and repair records for any of his boats. The company had two designated maintenance men. Federal and State regulations do not require that maintenance technicians for small passenger vessels be licensed or certified to hold their positions. Neither of the tour boat company's maintenance men had received formal training as a mechanic.

One of the maintenance man had worked for the company since 1977 on a seasonal schedule, coming from his home in Ohio every winter and returning in the spring after the high season. He had been service manager for a farm equipment firm in Ohio for 15 years, where he attended manufacturer-sponsored maintenance schools and worked with manufacturers' representatives on the equipment in the field. He had worked on vessel maintenance for 20 years, doing mostly minor repairs to engines and bilge pumps. At the time of the accident, he was working part time.

The other maintenance man had worked for the company since 1997, doing "everything"—cleaning boats, repairing boats, captaining boats. He told investigators he had been around boats all his life, that he held a captain's license to operate vessels of 25 gross tons, and that he had captained commercial crab boats.

One of the owner's sons also regularly helped maintain the company's boats. Both of the sons told Safety Board investigators that the company dry-docked its boats every year to have the sides and bottoms painted. One of the masters told investigators that bottom painting was done by a commercial boatyard. The sons said they would "get underneath there and . . . see if we've got any problems." They said they would check the driveshaft structure, including the strut bearings and the supporting shoe under the

strut. If the shoe was thin, they said, it would be replaced. They also said they replaced rotten wood, and generally made the boat "look pretty for the winter."

Engine servicing was mainly a matter of maintaining fluid levels and changing the filters; neither of the sons recalled following any specific manufacturer's instructions. The maintenance men normally checked the oil, the transmission, and the hoses in the morning before the boats left on tour, according to the sons. The masters did not check the boats for maintenance purposes or before getting under way with passengers. One of the maintenance men told Safety Board investigators that when boats malfunctioned or needed repairs, the masters would report the problem to the maintenance men, who would fix it. The wiring frequently needed repairing because of the saltwater, he said. He did not recall making any major repairs to the fiberglass on the *Panther*'s hull, except for sanding in spots.

Both the owner and his sons said that the company's boats commonly grounded, mostly in soft mud. The sons said that when a master came in after a grounding, they would lift the hatches to see whether water was coming in.[23] One of the maintenance men told investigators that it was the master's responsibility to know whether water was in the bilges.

Meteorological Information

Data from the National Weather Service in Key West, Florida, show that at the time of the accident, the air temperature was about 75° F. The sky was mostly cloudy,

[23] The hatches were squares of wood that had been cut out of the aft part of the deck over the starboard and port bilge pumps and that could be lifted up to access the pumps; the engine cover was also called a hatch.

with winds from the southeast at 15 knots and a visibility of 10 miles. Sunset was at 1744 on December 30, 2002.

Toxicological Testing

According to Coast Guard officials, the sinking of the *Panther* did not meet the criteria of a "serious marine accident" as defined by 46 CFR part 4.03-2,[24] the most common basis for the Coast Guard to require testing for drug or alcohol use. Federal regulations[25] at 33 CFR part 95.035 also permit law enforcement officers or employers to require toxicological testing whenever they have "reasonable cause."

The Coast Guard advised the Safety Board that, after the accident, the Park Service enforcement rangers contacted the Marine Safety Office in Miami to discuss toxicological testing of the master. The rangers reportedly advised the Marine Safety Office's chief of investigations that the *Panther* master did not exhibit any behavior after the accident that appeared to warrant drug or alcohol testing. The rangers and the Coast Guard official mutually agreed that the master should not be required to provide samples for analysis. Despite the determination of the officials, the master voluntarily submitted a urine specimen for a postaccident drug screen on December 31, 2002. The laboratory report does not indicate at what time the specimen was submitted. The results were negative.

[24] Title 46 CFR part 4.03-2 defines a serious marine incident as one that results in death, injury beyond first aid, damage to property in excess of $100,000, loss of an inspected vessel, or loss of a vessel of 100 gross tons or more.

[25] According to 33 CFR part 95.035, reasonable cause exists when an individual is directly involved in a marine casualty, defined as any incident that results in material damage affecting the efficiency of a vessel.

Survival Aspects

First Responders

The commercial crab boat *Red Rock* was only a few feet away when the *Panther* sank. A few passengers jumped directly onto the *Red Rock*, while others swam to it. After all the swimmers were on board, the *Red Rock* picked up three passengers clinging to a life buoy. The master and four passengers were rescued by the recreational boat *Hoosier Daddy* and the Park Service ranger boat. The *Panther* master told investigators that "if it had not been for the crab boat . . . we would have had fatalities in that accident."

Emergency Response

At 1440, the master of the *Red Rock* used VHF-FM radio channel 80 to report the accident to the radio operator at Everglades City Seafood. The radio operator telephoned news of the accident to Everglades National Park Boat Tours, which immediately dispatched its other two 31-foot tour boats (the *Skimmer* and the *Panther II*) to the accident scene. The tour boat owner did not report the sinking to the Coast Guard, the National Park Service, or Collier County EMS.

At 1450, after he was rescued by the *Hoosier Daddy*, the *Panther*'s master used the recreational boat's radio to send a distress call on VHF-FM channel 16, which was picked up by the Coast Guard in St. Petersburg. Approximately 40 minutes after the sinking (about 1515), the *Skimmer* and *Panther II* rendezvoused with the crab boat and the *Hoosier Daddy*. The master of the *Panther* took the helm of the *Panther II* and the passengers were transferred to the *Panther II* and the *Skimmer*. None of the rescue boats carried blankets or first aid supplies, and none of the rescuers counted the passengers.

National Park Service Response. A few minutes after the accident, a National Park Service ranger boat on routine patrol came on the scene and radioed the Park Service visitor center that the *Panther* had sunk. The ranger boat did not notify the Coast Guard or Collier County EMS.

The supervising ranger on duty at the visitor center heard the Park Service boat's transmission, instructed another ranger to monitor the radio, and walked downstairs to inform Everglades National Boat Tours of the accident (the Park Service and the tour boat company occupied the same building; see **figure 3**). The tour boat owner told the ranger that he had already dispatched two boats to the accident scene.

Shortly before 1500, the supervising interpretive ranger called 911, but the 911 dispatcher would not agree to send an ambulance because the ranger did not know whether anyone had been injured in the sinking. In her statement after the accident, the supervising ranger said she had not been able to find the direct numbers to the local fire/EMS station or the Collier County sheriff's substation, and so she called 911.

The ranger made several other calls to notify park supervisors of the accident. She then went downstairs to ask the tour boat owner if he could call an ambulance, and he said he would if it was necessary. The supervising ranger did not call the Coast Guard.

Coast Guard Response. At 1450, the Coast Guard Group station in St. Petersburg, Florida, about 150 air miles from the accident site, picked up the distress call from the *Hoosier Daddy*. According to the Coast Guard situation report, Group St. Petersburg tried to respond to the distress call but could not contact the *Hoosier Daddy* because of transmission and reception problems. Group St. Petersburg telephoned the Coast Guard duty standers in Key West to see if they had received the distress call (they

had not) and briefed the officer on duty at Coast Guard District 7 command center (D7CC) in Miami concerning the call.

At 1500, after D7CC gave its permission to use aircraft, Group St. Petersburg launched a search-and-rescue mission. It sent an HH-60 Jayhawk helicopter from Air Station Clearwater to the accident scene and directed Station Ft. Myers Beach to divert a 41-foot patrol boat to the scene. (The helicopter took an hour to reach the scene, and the patrol boat arrived 3 hours after the accident.) A Coast Guard Auxiliary aircraft, a twin-engine Piper Aztec, was immediately diverted to the scene to search for people in the water.

At 1510, the Coast Guard station at Ft. Myers Beach notified the ranger station at Everglades City that it was sending an auxiliary aircraft. The Coast Guard station called again 10 minutes later to inform the rangers that a helicopter was on the way.

The Piper Aztec made several passes over the accident area without finding anyone in the water. It remained in the vicinity about an hour, until the HH-60 helicopter arrived. By that time, the Coast Guard had diverted an HU-25 "Guardian" Falcon surveillance jet, based at Air Station Miami, to the scene from a law-enforcement patrol. Shortly after 1600, the HH-60 helicopter from Air Station Clearwater landed at Everglades City, under instructions to verify the number of rescued passengers against the *Panther*'s manifest.

At 1625, two Park Service rangers called Group St. Petersburg to report that neither the master nor the tour boat owner had a passenger manifest and that the number of passengers on board the *Panther* was uncertain (they said the number stated by the master ranged from 29 to 37). The rangers also reported that they could not confirm the number rescued because some passengers had already left the visitor center.

At 1630, because the number of passengers who had been on board the *Panther* was not documented and representatives of the tour boat company provided differing totals, D7CC directed the HH-60 helicopter to get airborne and conduct two searches near the sunken vessel, looking for people in the water. As soon as the HH-60 helicopter was airborne, the HU-25 Falcon returned to Miami, after flying over the area for 45 minutes. Shortly after 1700, at D7CC's direction, Station Ft. Myers Beach alerted divers at the Collier County sheriff's office in Naples (the county seat, 32 miles from Everglades City; see **figure 2**), who began traveling to the scene to search the sunken boat.

Three hours after the accident, at 1753, the Coast Guard 41-foot patrol boat arrived at the scene. The sun had just set. Working with the two Park Service rangers who had been sent to guard the *Panther* (which by this time had been towed to the sandbar), the two Coast Guard crewmen checked the boat and surrounding area for passengers who may not have been accounted for, but found no one. The search results were communicated to D7CC, which called off the Collier County divers, who were still en route.

About 1815, the HH-60 helicopter, after completing two searches, flew north for refueling to Naples. The Coast Guard patrol boat embarked on two search patterns between the mouth of Indian Key Pass and Chokoloskee Bay but found no one in the water. The helicopter returned to the scene, completed its third search at 2018 without finding anyone in the water, and returned to its base at Air Station Clearwater. At 1946, the patrol boat was directed to return to base.

The Coast Guard called off the search at 2103. Two Coast Guard investigators from the Miami Marine Safety Office arrived at the site of the sinking about 2230 and gave the owner's sons permission to tow the *Panther* farther onto the sandbar.

Collier County Response. At 1600, a half-hour after the rescued passengers had returned to the ranger station, the tour boat owner called the Everglades City fire department. He asked the fire department to alert the EMS crew that they were needed at the park, but not to use their lights or sirens. The county's ambulance and fire rescue truck shared a building in Everglades City, about 0.8 mile from the visitor center.

The ambulance and fire rescue truck arrived at the visitor center about 3 minutes after being notified by the fire department. A paramedic examined the 85-year-old woman passenger, at the request of the Park Service ranger, and an emergency medical technician examined another woman passenger who asked for assistance. Both were deemed to be in good condition. No one was taken to the hospital. The EMS team left the visitor center at 1630.

Emergency Equipment

Lifesaving Apparatus. The *Panther* had lifesaving equipment on board for 39 people. The equipment included the following:

Adult lifejackets	39
Child lifejackets	4
Ring buoys	1 (light and line attached)

The lifejackets were stowed in labeled lockers under the boat's seats, except for the bench seat in the stern (**figure 10**). Passengers' lifejackets were located in the seat in front of them (see **figure 16**), or in the case of the two small forward seats, under the bow bulwark. Access to the lifejackets was through openings in the backs of the seats, protected by covers with two barrel-bolt latches at the bottom, one on each side, and hinges at the top. To retrieve their lifejackets, passengers would have had to unlatch the

bolts and swing the covers toward themselves; to open the covers completely, passengers would have had to lift their feet. The company's owner said that the Coast Guard marine inspectors had advised him to install the covers.

Figure 16. Lifejacket locker on *Panther*.

The *Panther*'s 33 passengers ranged in age from 10 to 85. Five of the passengers were 17 or under, and two of those could not swim. Three of the adult passengers were also nonswimmers. None of the passengers was able to don a lifejacket before the *Panther* sank. The passengers told investigators that the master gave them no instructions about donning lifejackets and did not tell them to prepare to abandon ship. The master told Safety Board investigators that when the *Panther* started sinking, the passengers could not see or reach the latches to the lifejacket lockers because they were underwater. One passenger reported that she dived into the water, but the poor visibility (less than 1 foot) hampered her from finding the latches on the lockers, though she finally managed to retrieve a lifejacket and hand it to one of the nonswimming passengers who was hanging onto the *Panther*'s bow rail. None of the lifejackets floated free after the accident.

Firefighting Equipment. The *Panther*'s firefighting equipment consisted of three fire extinguishers (1 class B-I and 2 class B-II[26]) and a fixed, 10-pound-capacity halon fire-extinguishing system protecting the engine compartment.

Communication Devices. A VHF-FM radiotelephone and public address system, wired together, were mounted in the *Panther*'s steering console. A small door gave access to the equipment. The 12-volt battery that powered the radiotelephone and public address system were housed below deck, on the engine's port side. The same

[26] Class B extinguishers are for fires involving flammable liquid, grease, or gas. B-I extinguishers hold 2.5 pounds of dry chemical; B-II extinguishers, 10 pounds of dry chemical.

microphone was used for both systems. The master carried a portable VHF-FM radio in his personal effects as backup, but he said that he always kept it turned off. He told investigators that he did not have time to retrieve his radio during the sinking.

Tests and Research

Strut Support Blocks

The three wood support blocks from the *Panther* were sent to the Safety Board's Materials Laboratory for analysis and then forwarded to the U.S. Department of Agriculture's Forest Products Laboratory to assess the material's condition. According to the laboratory report, all three strut blocks were affected by brown rot decay. Decay occurs when wood is moist or alternately wet and dry. The laboratory concluded that "decay to [the observed] extent probably occurred over a number of years."

The top block, of southern yellow pine, had fallen into 10 pieces (see **figure 17**). Technicians could penetrate some pieces with a fingernail. Other parts were hard or "rubbery." Some surfaces were painted. The center block, a single piece of plywood, was also falling apart, especially at the edges. The brown rot decay on the center block was so severe that technicians could not identify the woods used in the plywood. According to technicians, the lower block, of bald cypress, had light rot because the wood is naturally resistant to decay. The lower block had soft material at the edges, determined to be either brown rot or soft rot fungi, and an odor consistent with creosote treatment.

Figure 17. Pieces of wooden strut blocks received for inspection.

In analyzing the strut blocks, the laboratory found evidence of "temporary repairs over the years as the decay was progressing," such as

> misshapen hardware (probably corroded) that had been covered over, other hard plastic material filling holes and edges, elastomeric materials [materials that resemble rubber] filling gaps and holes, and paint covering the filling materials.

Bilge Pump

The tour boat company's mechanic removed the *Panther*'s starboard bilge pump and gave it to Safety Board investigators, who shipped it to the Board's Materials Laboratory for testing. Laboratory technicians found that the pump did not work with the leads connected to the printed circuit board, but when the leads were placed directly on the motor, the pump began operating. The impeller continued to spin, as if the pump switch were on the manual setting (that is, set for continuous pumping).

Other Information

Coast Guard Inspections of the Panther

The Safety Board reviewed the Coast Guard inspection records for the *Panther* for the past 7 years and interviewed two inspectors: one who conducted the last recertification examination (May 2001) and reinspection (May 2002), and one who attended the last drydock examination in December 2000. **Table 2** summarizes the Coast Guard findings for inspections conducted between June 6, 1995, and May 21, 2002.

Table 2. Coast Guard inspections of *Panther,* June 1995 to May 2002

Date	Inspection Type	Comments
June 6, 1995	Recertification	Vessel boarded at anchor. Inspection book states: "Examined vessel exterior above the waterline and interior throughout as accessible, found sat[isfactory] with no visible damage."
August 25, 1995	Drydock	Vessel inspected on rails. Inspection book states: "Examined hull exterior. Found no evidence of damage or deterioration. Examined vessel interior. Examined all through-hull sea valves—sat[isfactory]. Hull accessible at engine compartment, shaft alley compartment, steering area and small access hole forward. All appeared in sat[isfactory] condition. Discussed with owner possibility of future access to find area under benches. Very cooperative and suggested access plates be installed under bench seats and have them more easily removed for inspection."
May 29, 1996	Reinspection	No deficiencies noted. Inspector boarded vessel afloat, "visually examined" hull for damage or pollution, "observed operation of VHF, engine, steering, and bilge pumps."
December 5, 1996	Drydock	Vessel inspected on rails. Inspection book states: "Examined hull exterior, sat[isfactory]. Examined hull interior, all compartments as accessible, owner had installed new access plates to hull interior, sat[isfactory]. . . Observed tests of new installed navigation lights, sat[isfactory]. Amended COI to delete daylight ops only. Water light installed on ring buoy."
June 9, 1997	Reinspection	Inspection book states that inspector boarded vessel afloat, "examined deck and hull exterior above the waterline for signs of damage or recent pollution" and "examined hull interior." All were found satisfactory.
May 14, 1998	Recertification	Inspection book states that vessel was boarded afloat, deck and hull exterior were inspected above waterline, interior hull was inspected, all were found in satisfactory condition.
December 8, 1998	Drydock	No deficiencies noted.
May 11, 1999	Reinspection	No deficiencies noted.
May 23, 2000	Reinspection	No deficiencies noted.
December 4, 2000	Drydock	No deficiencies noted. Activity report states: "examined all voids, compartments, bulkheads, stiffeners, and doors" and found conditions satisfactory. Outside hull and through-hull valves were also found satisfactory.
May 3, 2001	Recertification	One deficiency noted ("port aft engine mount is badly corroded and requires replacement"). Activity report states that inspector "examined all exterior areas for damage or pollution" and "all voids, compartments, bulkheads, deck, stiffeners" and found conditions satisfactory; bilge pumps and main engine and steering system (under way) were also tested.
May 21, 2002	Reinspection	Activity summary report lists three deficiencies as found and later corrected: accommodation/occupational safety (railings), fire fighting (documentation of fire extinguisher servicing), and personnel (CPR training for 50 percent of crew). All other checklist items listed as "inspected satisfactory."

According to the interviews with the Coast Guard inspectors and Coast Guard records, the recertification inspections and reinspections of the *Panther* generally involved speaking with the owner, examining the deck and hull above the waterline, checking the interior "as accessible," inspecting lifesaving and navigational equipment, conducting drills such as man-overboard, and examining documents. The inspections generally took between 1 and 2 hours, according to one of the inspectors. Drydock examinations were conducted with the boat on the marine railway at the visitor center. No deficiencies were noted at the last drydock inspection.

One of the inspectors told investigators that he had participated in about 30 inspections during the year he was in the Miami inspection unit. He said the unit sent out inspection teams of two or three Coast Guard personnel. The usual inspection procedure included walking through a boat looking for obvious signs of deterioration. If a boat had deck openings, the inspectors checked the bilge area with mirrors and flashlights, but they did not remove the deck boards or seats to allow a thorough inspection. The *Panther* had only three access openings (the two bilge pump hatches and the engine cover). The rest of the boat was not available for inspection unless part of the deck was removed.

According to the inspector, the hull inspection for fiberglass or wood-and-fiberglass boats consisted of "randomly probing the hull's surface with a spike or small hammer in an attempt to locate soft spots," which would result from delamination of the fiberglass or wood rot. In the inspection records examined by the Safety Board, no signs of wood rot were noted.

Coast Guard Procedure for Inspecting Wooden Boats

The Coast Guard's guidance for inspecting wooden boats is detailed in chapter 4 ("Guide to Inspections") of Navigation and Vessel Inspection Circular (NVIC) 7-95, issued on November 7, 1995 (attached to this report as **Appendix B**). NVIC 7-95 superseded NVIC 1-63, "Notes on Inspection and Repair of Wooden Hulls."

The guidance document groups problems with wooden vessels into three categories: (1) time (decay, wood borers, corrosion), (2) stress (cracks, broken members, failure of fastenings, failure of caulking), and (3) hull damage due to collision, grounding, or normal wear and tear. The guidance advises inspectors to "inspect the vessel out of the water with the interior of the hull opened up as much as possible." In discussing methods of detecting decay, the guidance notes that "serious deterioration of a wooden hull goes on within the wood itself with little or no outward sign until it is well advanced. In order to spot decayed wood . . . sounding with hammer can be of use." The guidance recommends using moisture meters in areas where deteriorated wood may be hidden by overlays or paint. Eight interior areas and five external areas are listed as particularly prone to decay, including bilges, areas where freshwater may have accumulated, and areas where end grain is present (such as at the terminal ends of floors). The guidance also describes wood borer attack.

A large section of the guidance is devoted to corrosion of metal fastenings. The final sections give guidance on inspecting caulking, fittings ("rudder and propeller struts and fastenings should be examined carefully"), and hull damage, and on evaluating deficiencies.

Sister Vessel Panther II

The *Panther II*, a sister to the *Panther* that was built in 1972, was drydocked after the *Panther* sank. According to the Coast Guard inspectors from the Ft. Myers Beach marine safety detachment, the *Panther II* was found to have significant areas of wood rot that had to be replaced before the vessel could return to service. The inspectors found, however, that the strut support blocks had been replaced with pressure-treated wood and did not exhibit any evidence of wood rot. As of the date of this report, the vessel had not returned to service.

Enforcement Jurisdiction

Designated National Park Service rangers had the responsibility for maintaining law and order in the waters of Everglades National Park, allowing them to enforce any Federal law or regulation inside the park.[27] The National Park Service signed a memorandum of understanding with the Coast Guard and the Florida Fish and Wildlife Conservation Commission granting concurrent jurisdiction to those agencies for enforcing laws and regulations in the park.

[27] As authorized by Title 16 United States Code chapter I, subchapter 1, section 1a-6, "Law enforcement personnel within National Park System."